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EXAMINER

PERT, EVAN T

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/029,390

Applicant(s)

KIM ET AL.

Examiner

Evan T. Pert

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2-13-02 (preliminary amendment).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because it contains grammatical informalities:

At p. 1, line 16, "are" should read --area--.

At p. 5, line 16 "wager" should read --wafer--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Device Isolation "Films"

The use of "device isolation *films*" in the claims [i.e. 1, 6, 7, 12, 17] is confusing since the disclosure seems to suggest known shallow trench isolation (STI), not "films". While applicant seemingly uses "film" to refer to an oxide material or some equivalent (such as 30 in Fig. 2), the scope of "device isolation *films*" as disclosed is unclear such that "device isolation films" could reasonably be interpreted as being "device isolation areas" or "device isolation structures".

For purposes of examination, the “*device isolation films*” in the claims are considered as being *any material added to the wafer topography that electrically isolates in the lateral direction*. Clarification of the scope of applicant’s claimed “device isolation films” is requested.

Crossing

The use of “crossing” [i.e. in claims 1 and 13] to describe how the interconnection diffusion layers are arranged with respect to the device isolation areas 30 is confusing because the figures and text disclose only the “line contact patterns” (e.g. 500a and 500b) as “*crossing the device isolation films 30.*” Actually, the “line contact patterns” [claim 1, line 10] are what are seen as “*crossing the device isolation films 30*” [Fig. 2].

Word Line Region?

A “word line”, as is well known in the art, implies an addressable array or matrix of cells, yet the claims seemingly use “word line” for another purpose, which is potentially confusing. Clarification of applicant’s “word line” region is required as to how it differs from an ordinary word line known in the art.

“Plurality” in A Word Line Region?

Claims 1 and 12 recite that a “plurality of diffusion layers” are “formed in a word line region” 60 yet only a single “diffusion layer” is shown connecting 50 to 70 by way of the diffusion layer in “a word line region” 60. Therefore, this limitation of a plurality of diffusion layers in a word line region in claims 1 and 12 seems unnecessarily limiting and potentially confusing.

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Electrically Isolated

Applicant's use of "electrically isolated" [i.e. in claims 4, 5, 9, 10, 15, 16] is improper for describing *positioning* of the line contact patterns in a *contiguous electrical path*. In claim 1, the fact that "current flows"[line 14] *necessarily means* the line contact patterns *cannot* be "electrically isolated" (as seen by the arrows showing current flow through electrically connected line contact patterns). Applicant's claims are seemingly drafted on the phrase "isolated/positioned" at p. 8, line 24, which is not true "electrical isolation" as is recited in the claims. Applicant could adopt positioning language such as at p. 9, to overcome this rejection.

Threshold Voltage Ion Implantation Region

In claims 12 and 14, the use of "threshold voltage" is confusing since "threshold voltage" implies a *transistor property* to one of ordinary skill in the art. Clarification is required as to how applicant's claimed "threshold voltage" differs from a "threshold voltage" of a typical transistor known in the art.

Electrically Connected By Applying A Voltage

In claim 14, the concept of "electrically connecting a channel by applying a voltage to a word line" is normally understood as being the application of a voltage to a transistor gate. However, in the instant case, the language is confusing because the disclosed test pattern for measuring contact resistance does not seem to operate with a transistor as part of it in the so-called "word line regions 60" [e.g. Fig. 2].

The examiner is confused about the location and electrical configuration of applicant's "word line" and how applicant's "word line" differs from commonly accepted terminology "word lines" used to describe gating features in actual memory devices such SRAM, EEPROM, etc..

Allowable Subject Matter

4. Claims 1, 6 and 12 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action.
5. Claims 2-5, 7-11, and 13-17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose applicant's "*test pattern* for measuring a contact resistance" [claims 1-5] or "method of manufacturing a *test pattern* for measuring contact resistance" [claim 6-17].

While Urayama (U.S. 5,851,869) discloses the majority of applicant's claim limitations in the form of a "monitor circuit" (depicted in his Fig. 2 and described at cols. 4-5), Urayama fails to disclose the provision of "device isolation films" in the gap designated "L1" in his Fig. 2 such that line interconnection patterns 2 "cross device isolation films" claimed in this case, but not mentioned or depicted by Urayama. Therefore, the prior art fails to disclose the test monitor in Fig. 2 of Urayama modified to include the "device isolation films" taught by applicant wherein the scope of "device isolation films" requires clarification for obviating rejection under 35 USC 112.

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Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Urayama (U.S. 5,851,869) is cited for disclosing a test monitor for measuring contact resistance, without applicant's so-called "device isolation films."

Cho et al. (KR 2001065696) is cited for teaching a contact resistance measurement pattern, but does not seem to disclose the structure depicted in Fig. 2 of the instant application or an equivalent (as is understood to be claimed).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan T. Pert whose telephone number is 703-306-5689. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 703-308-1233. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ETP
June 11, 2003


EVAN PERT